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Tris Hydrochloride

for molecular biology, cell culture & electrophoresis

ProductInformation

CAT No	Grade	Application	Storage
C1619	BioUltra, ≥99.5% (T)	Mol. biology, electrophoresis	Room Temperature
	BioXtra, ≥99.0% (T)	Mol. biology, electrophoresis	Room Temperature
	PharmaGrade, BioReagent, ≥99.0%	Mol. Biology, cell culture	Room Temperature

Product Name:	Tris hydrochloride, Tris(hydroxymethyl)aminomethane
CAS Number:	1185-53-1
Formula:	NH2C(CH2OH)3 ·HCl
Formula Weight:	157.6
Melting Point:	150-152 °C
pKa:	8.1
Synonym:	Tris HCl, 2-Amino-2-hydroxymethyl-1 3-propanediol hydrochloride,Tris(hydroxymethyl) aminomethane hydrochloride; Trizma® hydrochloride

Suitability

Tris hydrochloride is a salt of Tris base with hydrochloride acid and is useful as a reagent for stabilization of buffer formulations and electrophoresis of biological molecules.

Tris, also known as THAM, tris(hydroxymethyl)aminomethane, is anorganic compound with the formula (HOCH2)3CNH2. Tris is extensively used in biochemistry and molecular biology.In biochemistry, Tris is widely used as a component of buffer solutions, such as in TAE and TBE buffer, especially for solutions of nucleic acids. It contains a primary amine and thus undergoes the reactions associated with typical amines, e.g. condensations with aldehydes.

Buffering features

Tris has a pKa of 8.07 at 25 °C, which implies that the buffer has an effective pH range between 7.07 and 9.07.

Buffer details

The pKa declines approximately 0.03 units per degree Celsius rise in temperature.

Silver-containing single-junction pH electrodes (e.g., silver chloride electrode) are incompatible with Tris (Ag-tris precipitation clogs the junction). Double-junction electrodes are resistant to this problem, and non-silver containing electrodes are immune.

Making buffer solutions by neutralizing TrisHCl requires attention to the attendant changes in ionic strength.

Buffer inhibition

Tris inhibits a number of enzymes, and therefore it should be used with care when studying proteins.

Preparation

Tris is prepared industrially in two steps from nitromethane via the intermediate (HOCH2)3CNO2. Reduction of the latter gives tris(hydroxymethyl)aminomethane.

Uses

The useful buffer range for tris (7-9) coincides with the physiological pH typical of most living organisms. This, and its low cost, make tris one of the most common buffers in the biology/biochemistry laboratory. Tris is also used as a primary standard to standardize acid solutions for chemical analysis.

Tris is used to increase membrane permeability of cell membranes.

Tris is commonly used in buffer reagent, in electrophoresis, biological reaction and preparative chromatography. Many References on the preparation of Tris buffer solutions has been published.

All grades listed in this documents can be applied for protein, nucleic acid and other biological research. The BioUltra grade can be applied for high performance including but not limited to capillary electrophoresis, and the BioXtra grade can be applied for general use. All Grades with cell culture tested or endotoxin tested notes can be used for cell culture.

The pH values of all buffers are temperature and concentration dependent. For Tris buffers, pH increases about 0.03 unit per

°C decrease in temperature, and decreases 0.03-0.05 unit per ten-fold dilution.For precise applications, use a carefully calibrated pH meter with a glass/calomel combination electrode. Trizma is used in the formulation of buffer solutions in the pH range between 7.5 and 8.5. Tris buffer solutions are widely used in cell and molecular biology for processes such as protein and nucleic acid extraction and purification. Trizma based buffers are also in column chromatography and in gel electrophoresis. Trizma hydrochloride is used as a general reagent for the preparation of all types of Tris buffers. Component of extraction buffer e.g. phenol extraction of DNA or RNA1; Buffer component of separating and stacking gels in the characterization of in vitro translation products by SDS-PAGE.

Specification

Grade	BioUltra		
assay	≥99.0% (AT)	cation traces	Co: ≤5
impurities	DNases, none detected		Cr: ≤5
	RNases, none detected		Cu: ≤5
	insoluble matter, passes filter test		Fe: ≤5
	phosphatases, none detected		K: ≤50
	proteases, none detected		Li: ≤5
ign. residue	≤0.2% (as SO_4)		Mg: ≤5
loss	≤0.2% loss on drying, 110 °C		Mn: ≤5
pH	2.5-4.0 (25 °C, 4 M in H_2O)		Mo: ≤5
useful pH range	7.0 - 9.0		Na: ≤50
pKa (25 °C)	8.1		Ni: ≤5
solubility	H_2O: soluble4 M at 20 °C, clear, colorless		Pb: ≤5
anion traces（ppm）	sulfate (SO_4^{2-}): ≤50		Sr: ≤5
cation traces（ppm）	Al: ≤5		Zn: ≤5
	As: ≤0.1	λ	4 M in H_2O
	Ba: ≤5	UV absorption	λ: 260 nm Amax: 0.12
	Bi: ≤5		λ: 280 nm Amax: 0.08
	Ca: ≤10		
	Cd: ≤5		
Grade	BioXtra		
assay	≥99.0% (titration)	cation traces	Co: ≤0.0005%
impurities	Insoluble matter, passes filter test		Cr: ≤0.0005%
ign. residue (900°C)	≤0.2% (as SO_4)		Cu: ≤0.0005%
loss	≤0.2% loss on drying, 110°C		Fe: ≤0.0005%
pH	3.5-5.0 (0.5 M in H_2O)		K: ≤0.005%
useful pH range	7.0 - 9.0		Li: ≤0.0005%
pKa (25 °C)	8.1		Mg: ≤0.0005%
solubility	H2O: soluble0.5 M, clear, colorless		Mn: ≤0.0005%
anion traces	sulfate (SO_4^{2-}): ≤0.005%		Mo: ≤0.0005%
cation traces	Al: ≤0.0005%		Na: ≤0.005%
	As: ≤0.0001%		Ni: ≤0.0005%
	Ba: ≤0.0005%		Pb: ≤0.0005%
	Bi: ≤0.0005%		Sr: ≤0.0005%
	Ca: ≤0.001%		Zn: ≤0.0005%
	Cd: ≤0.0005%	absorption	A0.5M/260, H2O ≤0.015
			A0.5M/280, H2O ≤0.010
Grade	PharmaGrade, BioReagent		
Assay	≥99.0%		
form	powder		
impurities	Endotoxin, microbial, and trace metals,		
useful pH range	7.0 - 9.0		
pKa (25 °C)	8.1		
suitability	suitable for cell culture		
	suitable for manufacturing use		
foreign activity	Cytotoxicity, DNase, NICKase, RNase, and Protease; tested		